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**Heubel et al.**(10) **Pub. No.: US 2009/0250267 A1**(43) **Pub. Date: Oct. 8, 2009**(54) **METHOD AND APPARATUS FOR  
PROVIDING MULTI-POINT HAPTIC  
FEEDBACK TEXTURE SYSTEMS****Publication Classification**(51) **Int. Cl.**  
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**G06K 11/06** (2006.01)(75) **Inventors:** **Robert W. Heubel**, San Leandro,  
CA (US); **Ryan Steger**, Sunnyvale,  
CA (US); **Robert A. Lacroix**,  
Saint-Lambert (CA); **Muge**  
**Bakircioglu**, San Jose, CA (US)(52) **U.S. Cl. .... 178/18.03**(57) **ABSTRACT**

Correspondence Address:

**WOMBLE CARLYLE SANDRIDGE & RICE,  
PLLC**  
**ATTN: PATENT DOCKETING, P.O. BOX 7037**  
**ATLANTA, GA 30357-0037 (US)**

A method and apparatus for generating haptic surface texture with a deformable surface layer are disclosed. The haptic device includes a flexible surface layer, a haptic substrate, and a deforming mechanism. The flexible surface layer is made of elastic materials and is capable of reconfiguring its surface characteristics. The haptic substrate, in one embodiment, provides a first pattern in response to a first activating signal. Alternatively, the haptic substrate is capable of providing a second pattern in accordance with a second activating signal. The deforming mechanism is configured to change the flexible surface from a first surface characteristic to a second surface characteristic in accordance with the first pattern.

(73) **Assignee:** **Immersion Corp.**, San Jose, CA  
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